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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,402	10/17/2001	Yoshihiro Satoh	N32040200W	6789

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EXAMINER
RICHARDS, N DREW

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 08/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/981,402	SATOH, YOSHIHIRO	
	Examiner	Art Unit	
	N. Drew Richards	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 7-24* is/are pending in the application.

4a) Of the above claim(s) *7-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 21-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 8/4/03. These drawings are acceptable.

DETAILED ACTION

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1, 2, and 21-24 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's admitted prior art.

Applicant's admitted prior art, hereafter referred to as "APA", discloses in figures 16-21 a semiconductor device comprising a contact 30 which penetrates an interlayer insulating film 26 and is electrically connected with a diffusion layer (not shown) in the silicon substrate, a gate electrode 16,18 which is formed on the silicon substrate and contains a nitride film 20,24 at upper and side portions, and a silicon nitride film 20,24 for preventing carbon diffusion, which is formed on the silicon substrate while traversing a region except a portion for providing the electrical connection between the contact and the diffusion layer, and is formed on the nitride film at the upper and side portions of the gate electrode. Films 20 and 24 are each considered two separate nitride layers

laminated on one another where the first layer (the lower portion of 20 and the inside portion of 24) is the nitride film on the gate electrode while the second layer (the upper portion of 20 and the outside portion of 24) is the silicon nitride film for preventing carbon diffusion.

With regard to claim 2, the insulating film is disclosed on page 3 lines 8 and 9 as including tantalum oxide (Ta_2O_5) and the device is disclosed as being a dynamic random access memory having a memory cell capacitor film including the tantalum oxide.

With regard to claim 21, APA discloses a contact 30 which penetrates a first interlayer insulating film 26 and is electrically connected with a diffusion layer (not shown) in the silicon substrate, a capacitor contact 46 that is interposed between a lower electrode of the memory cell capacitor (not shown) and the contact 30 while penetrating a second interlayer insulating film 32 and a third interlayer insulating film 32, a conductor 33,34 which is formed on the second interlayer insulating film 32 and contains a nitride film 36,40 at upper and side portions, and a silicon nitride film 36,40 for preventing carbon diffusion formed on the third interlayer insulating film 32 while traversing a region except a connection portion between the lower electrode and the capacitor contact, and is formed above the nitride film at the upper portion of the conductor. Film 32 is considered a second interlayer insulator (bottom portion) and a third interlayer insulator (top portion) of the same material formed one on top of the

other. Films 36 and 40 are each considered two separate nitride layers laminated on one another where the first layer (the lower portion of 36 and the inside portion of 40) is the nitride film on the conductor while the second layer (the upper portion of 36 and the outside portion of 40) is the silicon nitride film for preventing carbon diffusion.

With regard to claim 22, the insulating film is disclosed on page 3 lines 8 and 9 as including tantalum oxide (Ta_2O_5) and the device is disclosed as being a dynamic random access memory having a memory cell capacitor film including the tantalum oxide.

With regard to claim 23, APA discloses a contact 30 that is electrically connected with a diffusion layer (not shown) formed in the silicon substrate while penetrating a first interlayer insulating film 26, the contact is electrically connected to a capacitor contact 46 that is interposed between a lower electrode of a memory cell capacitor (not shown) and the contact 30 while penetrating a second interlayer insulating film 32 and a third interlayer insulating film 42 for providing an electrical connection between the lower electrode and the contact, a conductor 33,34 which is formed on the second interlayer insulating film 32 and contains a nitride film 36,40 at upper and side portions, a silicon nitride film 36,40 for preventing carbon diffusion formed between the second and third interlayer insulating films while traversing a region except a connection portion between the lower electrode and the capacitor contact, and is formed on the nitride film at the upper and side portions of the conductor. Films 36 and 40 are each considered two

separate nitride layers laminated on one another where the first layer (the lower portion of 36 and the inside portion of 40) is the nitride film on the conductor while the second layer (the upper portion of 36 and the outside portion of 40) is the silicon nitride film for preventing carbon diffusion.

With regard to claim 24, the insulating film is disclosed on page 3 lines 8 and 9 as including tantalum oxide (Ta_2O_5) and the device is disclosed as being a dynamic random access memory having a memory cell capacitor film including the tantalum oxide.

Response to Arguments

4. Applicant's arguments filed 5/2/03 have been fully considered but they are not persuasive.

Applicant has argued that the background art does not show a silicon nitride layer formed on the nitride film at upper and side portions. This is not persuasive as in the rejection above it is explained that silicon nitride films 20 and 24 are considered two films laminated on one another. The inner portion of 24 (contacting the gate electrode) and the lower portion of 20 (contacting the gate electrode) are considered the first nitride film formed at upper and side portions of the gate electrode. The outer portion of 24 (contacting insulator 26) and the upper portion of 20 (contacting insulator 26) are considered the silicon nitride film for preventing carbon diffusion. There is no structural difference between the single layers 20 and 24 being considered two layers and two

layers of the same material formed one on the other. Since silicon nitride films are amorphous films, there is no structural difference between a single layer and two layers of the same material stacked one on the other. The amorphous films will result in no difference in structure at the interface between the layers as long as the layers are made of the same material. The claims do not include any limitations requiring a structural difference between the two layers and thus a single layer has the same structure as the two layers claimed.

Applicant also argues that treating the single layer as two layers is a modification that contradicts the reference. This is not persuasive as the background art has not been modified. The rejection is based upon the lack of structural difference between the two layers claimed and the single layer of the background. Since there is no structural difference, the background art has not been modified. Likewise, the rejection does not add a layer but merely points out that there is no structural difference between the two layers claimed and a single layer that may be considered two layers.

Applicant also argues that the rejection modifies the reference and thus cannot be based on 35 U.S.C. 102. This is not persuasive as the reference has not been modified. Naming a structure "one layer" or "two layers" is immaterial if there is no physical difference between the final product of the claim vis-à-vis the reference. Here, the result of the two nitride layers of the claim is the same structure as the single nitride layer of the background art. Thus, the structure of the nitride of the background is the same as that of the claims and no modification is needed.

In response to Applicant's request for a citation in support of the reasoning that there is no structural difference between a single nitride layer and two nitride layers formed one on the other, the above reasoning has been fully and clearly stated and no citation is necessary. If applicant feels that their two layers are structurally distinguishable over the single layer, applicant must provide evidence as proof.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (703)

306-5946. The examiner can normally be reached on M-F 8:00-5:30; Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NDR
August 13, 2003

GEORGE ECKERT
PRIMARY EXAMINER